

Surface Applications, CAFOs, & Cover Crops

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Green Bay & New London: January 31, 2017

Manitowoc & Fond du Lac: February 1, 2017

Jefferson: February 6, 2017

Dodgeville: February 7, 2017

Marshfield: February 8, 2017

Rice Lake: February 9, 2017



CAFOs & Surface Applications

- Are CAFOs prohibited from surface apply manure?
 - No
- Are CAFOs required to incorporate manure that has been surface applied?
 - Yes/No



Photo by Baeten, WDNR



CAFOs & Surface Applications

- NR 243 defines surface applied manure as: *'Manure applied to the ground surface by moving vehicles that is not incorporated or injected'*.
- NR 243 defines incorporation as: *'Mixing the manure with surface soil so that at least 80% of applied manure is covered with soil'*.
- NR 243 defines injection as: *'The placement of liquid manure 4 to 12 inches below the soil surface in the crop root zone using equipment specifically designed for that purpose'*.

CAFOs & Surface Applications

- Some grey areas between surface & incorporation
 - Example: Aerway





CAFOs & Surface Applications

- When/where can't a CAFO surface apply manure?
 - Within restricted areas.
 - 100 feet to a well, 1,000 feet to a community well, 25 feet to a wetland, etc.
 - When winter conditions exist.
 - Liquid Manure
 - Prohibited on frozen soils (soil that is frozen anywhere between the first ½" and 8" of soil.
 - Prohibited on snow covered soils (>1" of snow)
 - Solid Manure
 - Allowed on frozen and snow covered soils with a reduced application rate (60 lbs. P / acre total during winter)
 - Not allowed during February & March
 - Surface Water Quality Management Areas (SWQMAs) require additional BMPs such as incorporation.

CAFOs & Surface Applications

- When can a CAFO surface apply manure?
 - All areas outside of SWQMAs and restricted areas.
 - Surface applications within the SWQMA are dependent on the SWQMA option.



Photo by Baeten, WDNR



CAFOs & Surface Applications

- SWQMA Option #2

- Not apply manure within 25 feet of a navigable water, conduit to navigable water or wetland; and surface apply manure in all other areas of the SWQMA provided that all of the following conditions are met:
 - The application is on long-term no-till ground.
 - No-till farming that has been implemented a minimum of 3 consecutive years.
 - The ground has 30% crop residue or more at the time of application.
 - The hydraulic application rate is limited to that specified in Table 3.

TABLE 3 Maximum Rates of Unincorporated Liquid Manure and Process Wastewater Applied Within a SWQMA	
Surface Texture Class ¹	Max Application Rate (gallons/acre)
Fine	5,000
Medium	7,500
Coarse	10,000

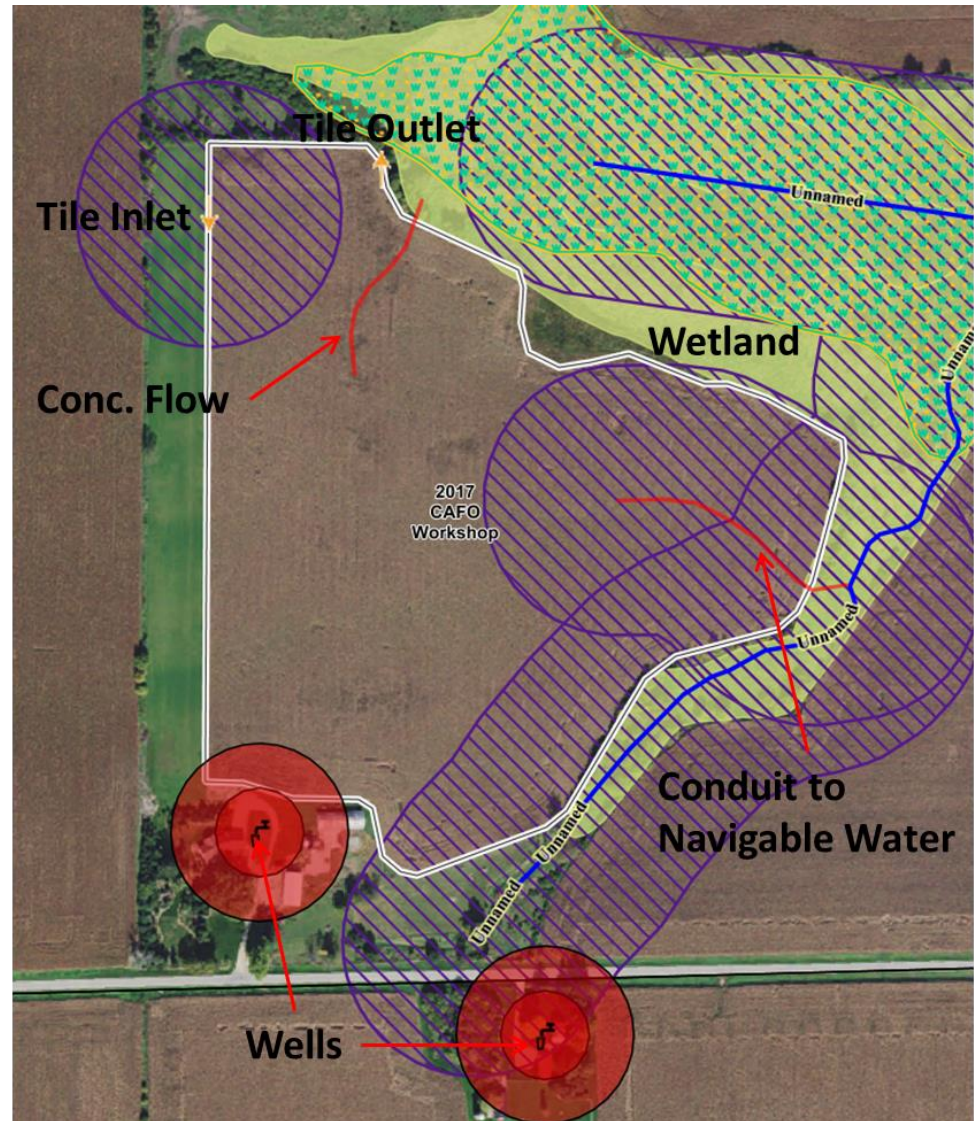
¹ Fine – clay, silty clay, silty clay loam, clay loam.

Medium – sandy clay, sandy clay loam, loam, silt loam, silt.

Coarse – loamy sand, sandy loam, sand. This category includes peat and muck based on their infiltration capacity.

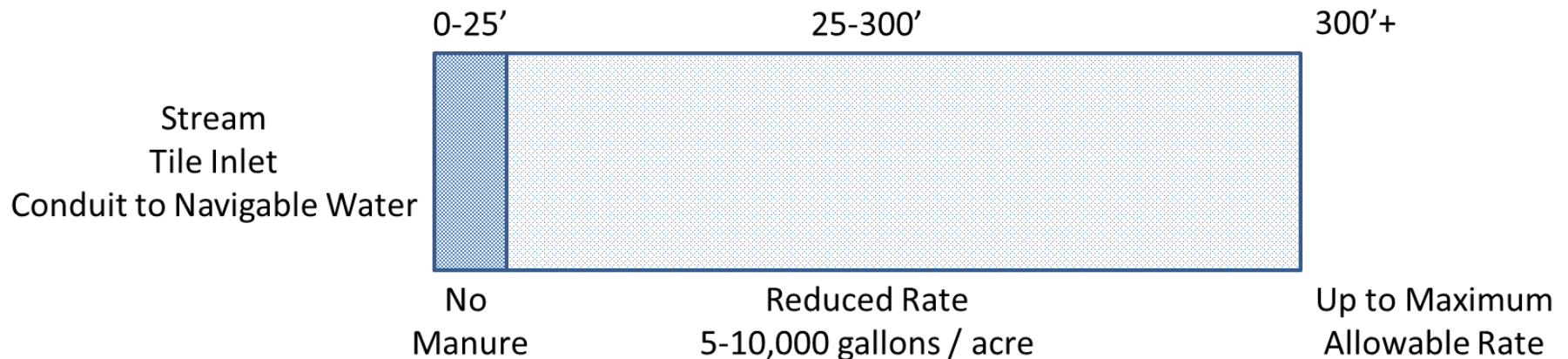
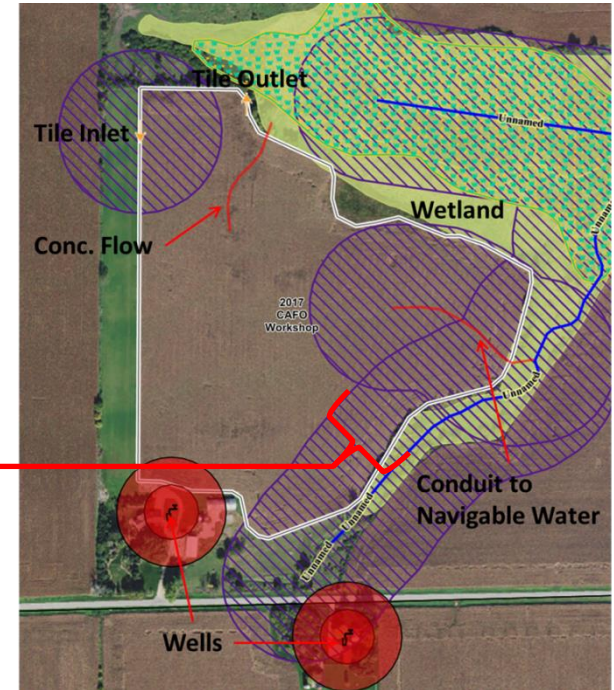
CAFOs & Surface Applications

- SWQMA Option #2
 - 25 foot setback to tile inlet, stream and wetland.
 - 100 foot setback to well.
 - 200 foot setback to well if upslope.
 - No manure in conc. flow channel.



CAFOs & Surface Applications

- SWQMA Option #2
 - Field is long-term no-till
 - 30%+ residue





CAFOs & Surface Applications

- SWQMA Option #3
 - Establish a 35-foot wide vegetated buffer adjacent to the navigable water, conduit to a navigable water or wetland where there is no application of manure on the buffer. Surface apply in all other areas of the SWQMA provided the ground has 30% residue or more at the time of application and the rate is limited in accordance with Table 3.
- SWQMA Option #4
 - Establish a filter strip (NRCS 393) that is a minimum 21 feet wide adjacent to the navigable water, conduit to a navigable water or wetland. Surface apply in all other areas of the SWQMA provided the ground has 30% residue or more at the time of application and the rate is limited in accordance with Table 3.

CAFOs & Surface Applications

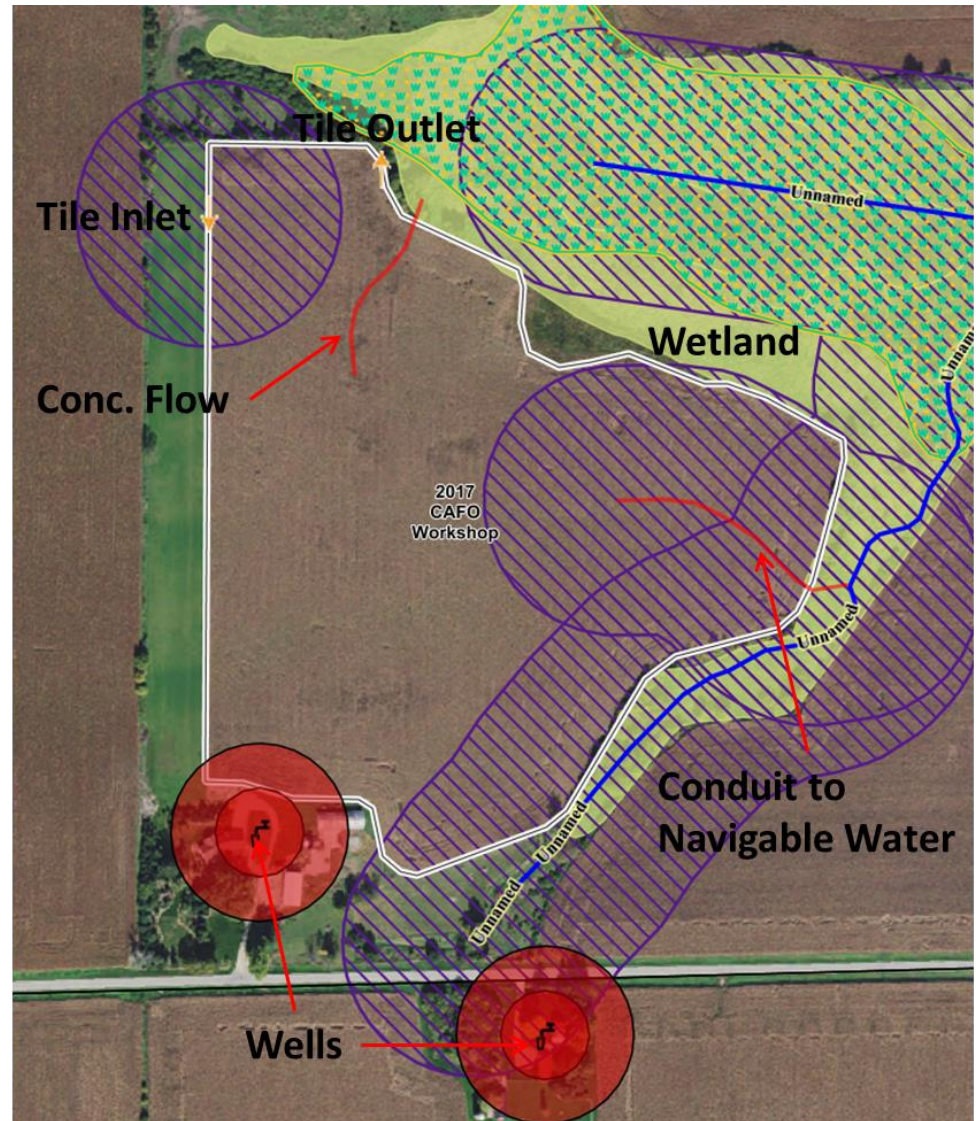
- SWQMA Option #5
 - Not apply manure within 100 feet of a navigable water or conduit to a navigable water.
 - 25 feet to a wetland



Photo by Jones, WDNR

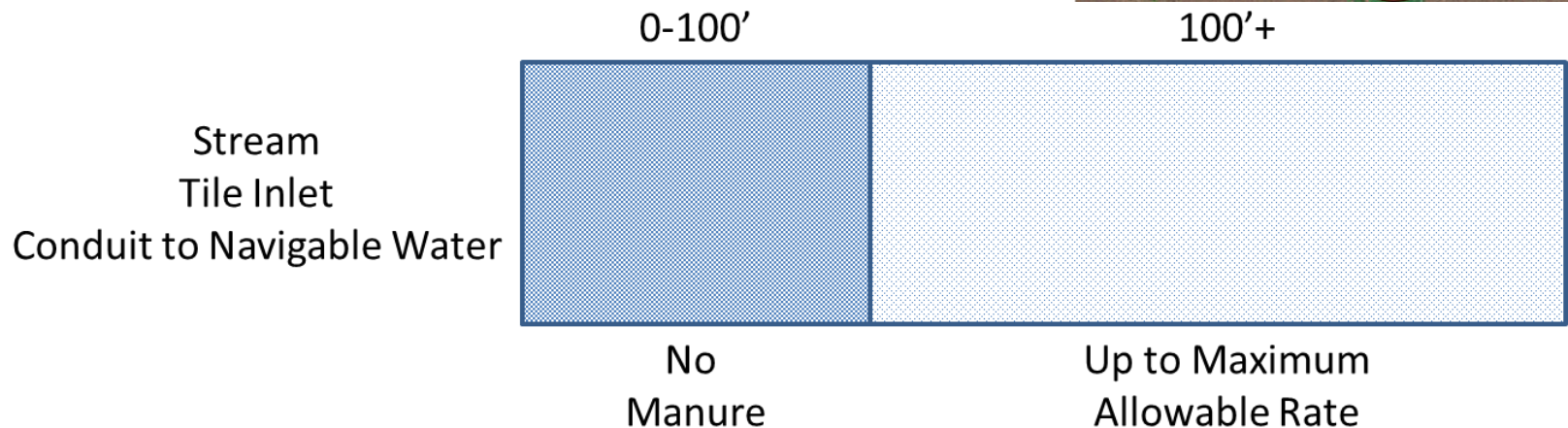
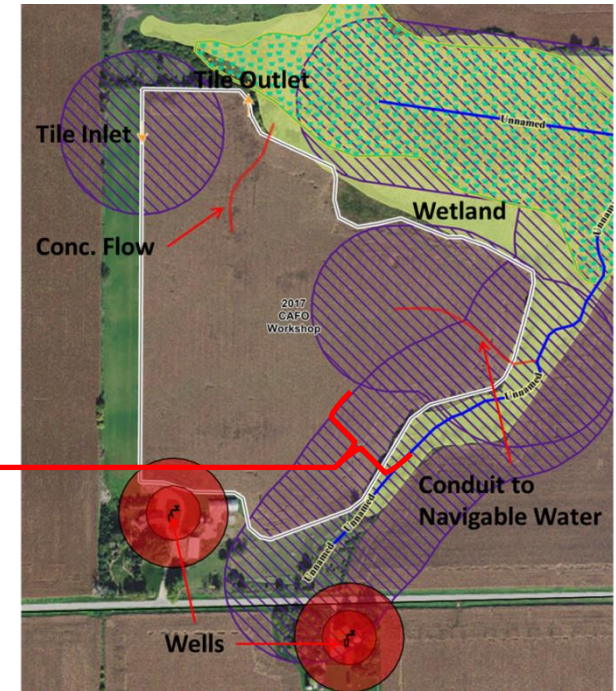
CAFOs & Surface Applications

- SWQMA Option #5
 - 100 foot setback to tile inlet and stream.
 - 25 foot setback to wetland.
 - 100 foot setback to well.
 - 200 foot setback to well if upslope.
 - No manure in conc. flow channel.



CAFOs & Surface Applications

- SWQMA Option #5





CAFOs & Surface Applications

- SWQMA Option #6
 - Implement other practices within the SWQMA that are approved, in writing, by the department provided that the permittee demonstrates pollutant reductions are equivalent to, or better than, reductions achieved by not applying manure or process wastewater within 100 feet of downgradient navigable waters or conduits to navigable waters.
 - Models such as SnapPlus can be used.
 - Such a request would not be considered a nutrient management plan substantial revision.

CAFOs & Surface Applications

- Other rules CAFOs should consider when surface applying manure:
 - Manure may not pond on the application site.
 - Manure may not run off the application site nor discharge to waters of the state through subsurface drains.
 - Practices shall retain land applied manure on the soil where they are applied with minimal movement.
 - Manure may not be surface applied when precipitation capable of producing runoff* is forecast within 24 hours of the time of planned application.

*Don't get confused with 24 hr./25 yr. event.



Photo by Jones, WDNR

CAFOs & Cover Crops

- Does NR 243 contain any specific regulations to cover crops and manure applications to cover crops?
- **NO**



CAFOs & Cover Crops

- CAFOs are required to:
 - Meet the field's tolerable soil loss (T).
 - Meet a rotation phosphorus index (PI) or 6 or less and an annual PI of 12 or less.

Cover crops are an option to help farmers meet T & PI.

Field Name	Soil Series & Symbol (critical)	Slope	Tillage	Rot Avg PI	PI	2017	2018	2019	2020
Cover Crop	NEWGLAR US DsB2	4	NT/NTcvr-NT/NTcvr-NT/NTcvr-NT/NTcvr	3	Total	3.0	3.0	3.0	3.0
					Particulate	2.2	2.2	2.2	2.2
					Soluble	0.8	0.8	0.8	0.8
					AcuteWLoss	0.0	0.0	0.0	0.0
No Cover Crop	NEWGLAR US DsB2	4	NT-NT-NT-NT	4	Total	4.2	4.2	4.2	4.1
					Particulate	3.2	3.2	3.2	3.2
					Soluble	1.0	1.0	0.9	0.9
					AcuteWLoss	0.0	0.0	0.0	0.0

Field	Soil Series & Symbol (critical)	Slope	Slope Len	Contour/ Filters	Rotation	Tillage	Field "T" t/ac/yr	Rot Avg Soil Loss t/ac/yr	Rot Avg Sed Del t/ac/yr *	2017	2018	2019	2020
Cover Crop	NEWGLARUS DsB2	4	200	No / No	Csl+cv-Csl+cv-Csl+cv-Csl+cv	NT/NTcvr-NT/NTcvr-NT/NTcvr-NT/NTcvr	2	2.0		2.0	2.0	2.0	2.0
No Cover Crop	NEWGLARUS DsB2	4	200	No / No	Csl-Csl-Csl-Csl	NT-NT-NT-NT	2	3.0		3.0	3.0	3.0	3.0



CAFOs & Cover Crops

- Cover crops may also provide these potential benefits:
 - Reduced Erosion
 - Increased Soil Organic Matter
 - Improved Nitrogen Cycling
 - Enhanced Soil Biology
 - Suppress Weeds
 - Insect Support/Suppression

<http://fyi.uwex.edu/covercrop/>



CAFOs & Cover Crops

- How are farms incorporating cover crops and manure applications?
 - Surface Application on Established Cover Crop
 - Don't smother the cover crop
 - May have a reduced rate when applying in a SWQMA
 - Subsequent applications may be made to meet the desired nutrient needs.
 - Setback to surface waters and conduits can be reduced under a no till system
 - Surface Application directly after seeding of cover crop
 - Reduces the risk of smothering the cover crop

CAFOs & Cover Crops

- How are farms incorporating cover crops and manure applications?
 - Surface Application

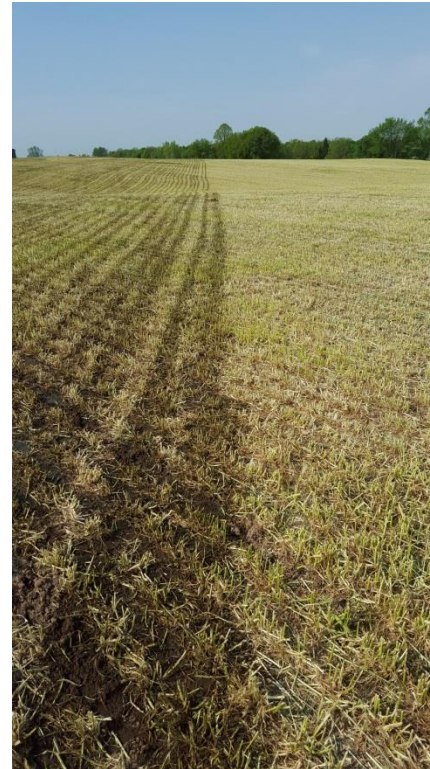


Photo by Petersen, Brown Co. LCD

CAFOs & Cover Crops

- How are farms incorporating cover crops and manure applications?
 - Surface Application



Photo by Gruetzmacher, Barron Co. LCD

CAFOs & Cover Crops

- How are farms incorporating cover crops and manure applications?
 - Take advantage of non-Fall spreading windows.
 - Spring +
 - Summer
 - = Less manure in the fall

Spring Injection into Cover Crop



Photo by Baeten, WDNR

CAFOs & Cover Crops

- How are farms incorporating cover crops and manure applications?
 - Manure Slurry Seeding of Cover Crops



<http://fyi.uwex.edu/covercrop/manure-slurry-seeding-of-cover-crops/>

CAFOs & Cover Crops

- How are farms incorporating cover crops and manure applications?
 - Vertical/Low Disturbance Manure Injection into Cover Crop



Photo by Petersen, Brown Co. LCD

CAFOs & Cover Crops

- How are farms incorporating cover crops and manure applications?
 - Vertical/Low Disturbance Manure Injection into Cover Crop



Photo by Gruetzmacher, Barron Co. LCD



CAFOs & Cover Crops

- Things to consider when using cover crops.
 - If you are using a no-till system you can reduce your setback to surface water and conduits from 100 to 25 when surface applying manure.
 - Note: a cover crop may be needed to meet the minimum 30% residue cover (ex. After corn silage).
 - Cover crop must get established in order to take credit for soil and phosphorus loss reduction.

QUESTIONS

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